

On the Road

ON THE RELIEF ROUTE-S.R.1

Route 7 to U.S. Route 113

Issue 3

Spring 1990



Desirable replacement sites for wetlands lost to construct SR-1, indicated on the photo to the left, include cleared wetlands that could be reforested and areas that could connect isolated wetlands to larger wetland systems. A main goal is to maintain a diversity of habitats by restoring Delaware's forested landscape.



Delaware
Department of Transportation

Kermit H. Justice, Secretary
Robert D. Bewick Jr.,
Deputy Secretary
John T. Davis, Director
Division of Highways

On the Road is published by the Delaware Department of Transportation and is the official newsletter of the SR-1 Relief Route project.

DELDOT BUILDS WETLANDS

To comply with the federal "no net loss" policy, DelDOT is planning to replace the nearly 200 acres of wetland habitat that will be lost to construct SR-1. DelDOT will create new upland forests, restore artificially drained wetlands and enhance degraded wetlands. Two acres of forested wetland will be provided for every acre destroyed. This allows for the fact that "new" wetlands must mature before they can replace the value of the lost sites. DelDOT also proposes to place in permanent State ownership and protection much of the 400 acres of wetland on landlocked parcels acquired for the new road.

In 1987, when planning was completed, DelDOT expected to replace only 80 acres of wetland. That

figure has nearly tripled in part due to changes in federal guidelines. Poorly drained pockets in farm fields are now defined as wetlands. Also, areas that were bone dry during the 1987 field review were submerged under several inches of water in 1989.

DelDOT's wetland policy for a decade has been to give back what it takes, acre for acre, of equal or better quality. The agency has received State recognition for its success in creating tidal wetlands. The project, along Route 113 on the St. Jones River, not only restored lost acreage but improved the overall quality of adjacent wetlands. DelDOT expects to be as successful in creating quality freshwater wetlands for the Relief Route. ■

CONTRACTORS SHOWCASE HELD

DelDOT held a Relief Route Showcase on March 15th for highway contractors and construction material suppliers from throughout the eastern U.S. Over 150 contractors and suppliers from as far away as New England and Louisiana attended the showcase held at the Blue Hen Mall Theater in Dover. The event, the first of its kind in Delaware, is intended to encourage competitive bidding on the \$500 million project.

The program opened with a welcome by Secretary Kermit H. Justice. Following was an overview of

the SR-1 project and other highway and bridge projects in Delaware. Participants received handouts detailing types and quantities of materials needed to construct the mainline roadway, stream crossings, and the new bridge over the C&D Canal. They were invited to review plans with the design engineers and to obtain information about pre-qualification and bidding. Contractors expressed concern about the availability of adequate borrow in close proximity to sites. Bidding for the mainline will open in June. ■

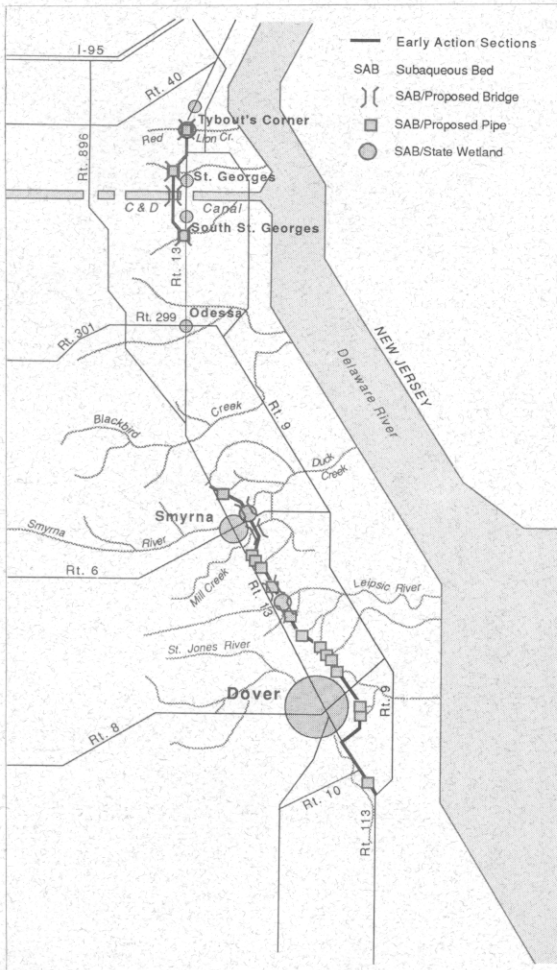


Hydrologist Pat Phillips evaluates a wetland.
Story page 4.

IN THIS ISSUE

- Permit applications submitted.....2
- Bypass construction anticipated.....2
- Advance Contracts.....2
- Owners wetland workshop.....2
- Milestones in wetlands protection.....3
- Interview with environmental consultants.....4
- Pavement errata.....6
- How to contact the consultant team.....6

Mile STONES



The locations of impacts requiring permits (other than non-tidal wetlands) are shown above.

Pictured below is consultant Matthew Kremer discussing wetlands replacement with a farmer.



• **WETLAND PERMIT APPLICATIONS SUBMITTED** - Following federal, state, and local regulations, DelDOT has submitted the applications for permits to construct the Smyrna-Dover Bypass and the St. Georges Section in wetlands and over waterways. In order to obtain the permits needed to fill any portion of wetlands, DelDOT must demonstrate that the loss of the sites is unavoidable and that a plan for their replacement is in place. Approval of these applications is anticipated in June. Formal issuance of permits is required prior to advertisement for construction contracts.

Permit	Jurisdiction	Agency
Section 404/10	non-tidal wetlands	US Army Corps
Navigation Determination	C&D Canal	US Coast Guard
State Wetlands	tidal wetlands	DE Natural Resources
Subaqueous Beds	underwater lands	DE Natural Resources
Floodplain Approval	100-year floodplain	New Castle County

• **SMYRNA-DOVER BYPASS CONSTRUCTION BIDS TO OPEN** - Assuming timely receipt of wetland permits, bid advertisement for the Smyrna-Dover Bypass will open this summer. Construction bidding for the Dover portion of the bypass is scheduled to open in June and a contract awarded by August. The Smyrna portion of the bypass will be advertised in July with a contract awarded in September. Completion of both segments is anticipated by mid-1993. The upgraded segment along Route 113 at Dover Air Force Base is scheduled for advertisement in early 1991.

• **ADVANCED CONTRACTS** - Construction of the SR-30 bridge near Smyrna is anticipated for completion in September. A-DEL Construction of Newark is continuing to drive concrete production piles after completing the pier portion of the bridge. Kuhn Construction, working at the White Oak Road (K66) bridge site, has driven the steel monotube shell piles for the pier footing, completed construction of the pier, and begun to haul fill dirt to the site. The anticipated completion date is January 1, 1991. The bridge to carry Woodland Beach Road (SR-6) over the Relief Route near Smyrna was begun on February 1 by James Julian Construction. Realignment of existing SR-6 for the approaches to the bridge will be required. James Julian also won the contract for the K345 and K14 bridges located in Dover. Construction is expected to begin in early May of this year and will be completed in spring 1991. Progress on the advanced construction contracts along the Smyrna-Dover Bypass Section is proceeding on schedule. Advertisement for bids on the relocation of Lafferty Lane opened on April 3rd.

• **OWNERS WETLAND WORKSHOP** - On March 7 DelDOT held a workshop for 31 owners whose property is being considered as a site for wetland restoration. These properties, some of which are outside the Relief Route corridor, have the characteristics needed to create a successful wetland--hydric soils, poor drainage, flat topography--and are located near the type of wetland to be reproduced. DelDOT is interested in acquiring at least 200 acres of marginally productive farmland, preferably in a few large parcels rather than numerous small parcels. Each owner would be financially compensated for the acquisition of the property. While participation is voluntary, the majority of the attending owners seemed interested in the wetland restoration program. ■

MILESTONES IN WETLAND PROTECTION

- **Pre 1900** - Wetlands and waterways are essentially unregulated. River and Harbor Act (1899) regulates work affecting navigable waters. Federal agencies (U.S. Army Corps of Engineers) for first time have some authority over discharges into non-tidal wetlands.
 - **1900-1950s** - Wetlands generally perceived as wastelands go unprotected. Half a million acres of wetlands are paved, drained for agriculture, dredged and filled for industry and housing developments, and used for landfill. U.S. Fish and Wildlife Service (FWS), responsible for protection of habitats of migratory birds, conducts first nationwide inventory of wetlands (1954).
 - **1960s** - Rapid loss of wetlands becomes public concern. Some states pass laws to protect coastal wetlands. National Environmental Policy Act adopted (1969). Projects receiving federal funds, such as the Relief Route, require formal evaluation of impacts on the environment.
 - **1970s** - Coastal wetlands protected by federal agencies under the Water Pollution Control Act (1972) and Clean Water Act (1977). U.S. Environmental Protection Agency (EPA) created as overview agency. Projects affecting tidal waters need Corps permits with FWS review. Delaware passes State Wetlands Act (1973) covering tidal wetlands. Freshwater wetlands remain unprotected.
 - **1980s** - Wetlands mitigation policy (1978) adopted by EPA, Corps, and FWS. Mitigation includes: (1) avoidance of adverse impacts, (2) use of construction practices that reduce effects, and (3) compensation for unavoidable losses by creating or restoring other on-site or off-site wetlands. Corps regulations (1982) to protect non-tidal wetlands prove ineffective. Vast majority of permitted losses were uncompensated.
- National Wetlands Policy Forum (1988) adopts two goals: (1) achieve no overall net loss of nation's remaining wetlands and (2) increase over time the quantity and quality of nation's wetlands resources. Clean Water Act reinterpreted (1989) includes farm fields with wetland soil characteristics.
- **1990s** - New federal and state regulations passed to enforce "no net loss" policy. Need to coordinate federal, state and local review and permitting processes is addressed. Delaware considers modifying State Wetlands Act to include freshwater wetlands. ■

Farm field wetlands are important for their hydrologic functions. The presence of vegetation helps prevent soil erosion. With minor changes, these wetlands would return to their original forested state.



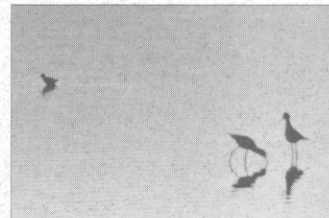
TRENDS IN WETLAND LOSS

United States

- When the Europeans arrived, the continental U.S. supported some 215 million acres of wetlands. Today only 95 million acres exist.
- An estimated 200,000 to 400,000 acres of wetlands continue to vanish each year, over 90% due to farming and development.

Delaware

- From the 1950s to the early 1970s, 450 acres of coastal and tidal wetlands were lost annually, mostly due to development.
- Since adoption of the State Wetlands Act in 1973, loss of coastal and tidal wetlands has been reduced to 30 acres per year.
- Inland freshwater wetlands continue to disappear at a rate of 1,500 acres per year.
- Construction of SR-1 will result in a net gain of over 100 acres of freshwater wetlands. Another 400 acres will be placed under permanent State protection.



1ne PERSPECTIVE



"Perspective" is a regular feature of *On the Road* and is designed to provide readers with insights into the "behind the scenes" activities associated with the Relief Route. Each "Perspective" will include an interview with key persons involved in the ongoing design and construction activities.

In this issue, "Perspective" interviews Dr. Steven D. Bach of WAPORA, Inc. and Dr. Michael Josselyn of Wetlands Research Associates, Inc. both pictured at left. Steve, on the left, is an ecologist who has been involved with the assessment of the environmental impact of the Relief Route since 1984. Mike, on the right, is also an ecologist and is the lead consultant in the design of the wetland mitigation plan for the Relief Route.



Forested wetlands are typically found along the boundary between watersheds and are home to deer and migratory birds.

Q. What wetlands will be affected by the first phases of the Relief Route?

SB. Construction of the Relief Route will require filling all or portions of approximately 72 wetlands totaling over 200 acres. The greatest impact, 140 acres, will be on forested or 'winter' wetlands, which can be recognized by their red maple, green ash, and sweetgum trees. These fresh water, seasonally flooded wetlands tend to be isolated wooded areas located in depressions on upland sites or along streams. Farm field or 'early successional' wetlands will also be affected. These fields were originally wetlands that have been drained and cleared by farmers for agricultural use. Farm field wetlands have only recently been recognized and regulated as wetlands. The Relief Route will also affect 55 acres of emergent wetlands, which include the cattail marshes that most people think of as a typical wetland. The last type is the tidal or saltwater wetland, which occurs in estuaries. Less than half an acre of this type will be affected.

Q. Why are Delaware's forested wetlands valuable?

MJ. A primary reason why forested wetlands are protected is because of the great decline over the years of these habitats which are used by many of Delaware's fish and wildlife. For example, the black duck, which during part of its life cycle depends on Delaware's forested wetlands, is scarce. Most people are aware of the importance of protecting the tidal wetlands along the Delaware Bay. Non-tidal, freshwater wetlands in the upland areas are just as significant.

SB. Forested wetlands play a significant role in the region's water cycle. They support dense vegetation which slows the speed of moving water and reduces flood damage. Wetlands also help control soil erosion by trapping sediments as they retard flood waters. Forested wetlands store and purify the groundwater supply. In many cases, upland forested wetlands trap rainwater which then flows downhill to streambank wetlands for storage. Wetland soils hold water and filter out impurities and pollutants.

Q. What is being done to protect local wetlands?

SB. Highway planning is like threading a needle through the region's many resources. It is therefore by its very nature a compromising process. During the planning phase of the Relief Route, impacts on wetlands and their values were balanced against impacts on homes and communities, businesses, farms and cultural resources. The final alignment represents the result of this issue-resolution process. Permanent loss of wetlands was minimized to the greatest extent practicable. Wherever a loss was unavoidable, local wetlands will be protected through the replacement of every habitat eliminated by the Relief Route.

WHAT IS A WETLAND?

Wetlands are saturated areas occurring between well-drained, rarely flooded uplands and flooded deep water lowlands. They are identified by their hydrology (water table at or near the surface), soils and vegetation.

Wetland Values

Habitat:

- Fish and shellfish
- Waterfowl and other birds
- Furbearers and other wildlife

Environmental:

- Water purifier
- Erosion control
- Flood Storage
- Nutrient recycling
- Food chain support

Socioeconomic:

- Flood control
- Water supply
- Livestock grazing
- Commercial fishing
- Recreation
- Aesthetics

Q. How are wetlands recreated?

MJ. We duplicate the characteristics of the lost wetland. We look for sites that have poorly drained, hydric soils, many of which were once forested hardwood wetlands but are currently farmed. On these sites we will return the hydrology to its original condition; plant sweetgums, sweet pepperbushes, swamp azaleas, and other wetland species; and essentially recreate the historic wetland at that site.

We plan to disperse the sites throughout the area to ensure the same types of habitat on a regional basis. It is important to maintain the benefits of wetlands--flood control, water quality preservation and wildlife habitat--within the same region. To balance the resource lost, the replacement wetland must be located as close to the original site as possible but at least within the same watershed.

Q. What are the actual steps involved in building a wetland?

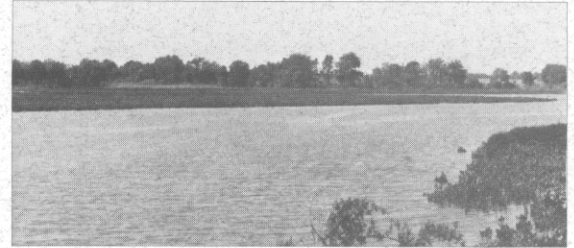
MJ. The first step in creating wetlands is to select possible sites using soil and topographic maps. Next we test the soils to determine the underlying soil conditions; observe the hydrology, how water flows and ponds; and evaluate possible undesirable effects of a new wetland, such as flooding or breeding of mosquitos. Finally, we consider surrounding land uses and whether any historical or archaeological resources could be affected.

Once a site is selected, we develop a plan for the new wetland. The existing drainage and grading of the site must be altered to increase ponding and ensure an adequate supply of water necessary to recreate a wetland condition. We then prepare the soils and plant the types of vegetation common to the lost wetland. A maintenance program of ten to fifteen years, depending on the type of wetland, is also a part of the mitigation plan.

Q. What is involved in the maintenance of a created wetland?

MJ. The main difficulty is giving the plantings time to reach maturity. A forested wetland can take as long as 25 to 30 years to reach full growth, while an emergent wetland matures in only three years. So the most critical activity during the early years is preventing deer from grazing on the young saplings and controlling weed growth. Monitoring the site also involves watching plant mortality, measuring tree growth, and marking water levels to see that the hydrological systems are functioning correctly. DelDOT, with the assistance of the consultants and local universities, is responsible for creating a monitoring

("Perspective" continues on page 6)



Emergent wetlands are semi-permanently flooded areas located on the edge of ponds, along streams, or in seepage areas. They provide a habitat for breeding waterfowl.

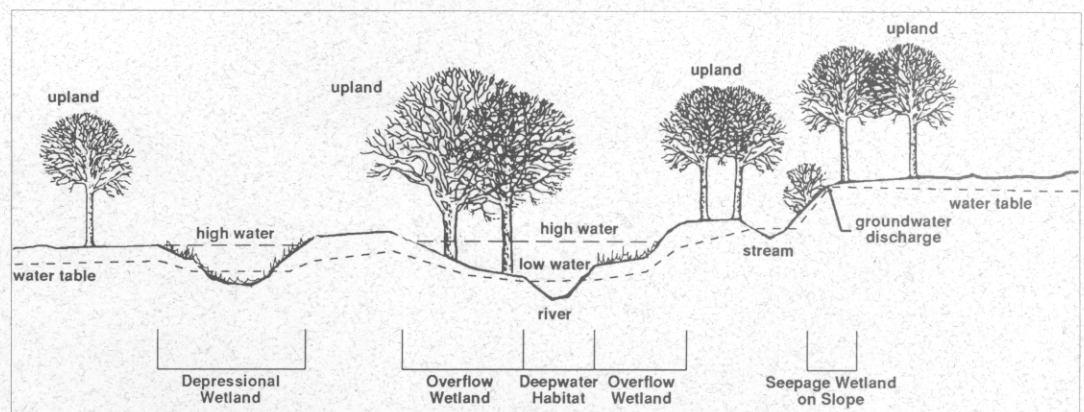


This tidal emergent wetland, located near Drawyers Creek, is used as a spawning ground by freshwater fish.



St. Jones River is a forested tidal wetland that provides an important wildlife corridor in the state.

This diagram shows wetlands, deepwater habitats, and uplands on the Delaware landscape.



Reprinted from Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and DE Department of Natural Resources and Environmental Control.

("Perspective" continued from page 5)

plan for a minimum of three to five years.

Q. What is the state-of-the-art of wetland creation? What are the keys to success?

SB. Creation of a forested wetland habitat is a new concept in Delaware, although there are examples in New Jersey and Maryland. In Mississippi, ecologists have experimented with restoring bottomland forests, but these wetlands are very different from the seasonal wetlands of Delaware.

MJ. Wetland creation is an emerging science. As a new field, there are lots of risks and unknowns. We cannot just plant trees and let them go. A wetland is a living, growing system which must be nurtured. Most failed sites have been the result of

poor planning and management. It is critical to watch for and correct mistakes as they come along.

Q. Could you comment as scientists on existing wetland policy?

SB. In the last two years, laws governing the filling of wetlands have become more restrictive. There is a large body of scientific information on the value of wetlands, and legislation is being passed to protect them. These laws and regulations are not arbitrary but are based on sound technical information. On the other hand, wetland restoration policy needs to be flexible because the art of wetland creation is still in its early, experimental stages. ■

Errata

The cover article in the Winter 1990 issue, "Concrete Chosen to Pave Relief Route", described 'hotmix' as a mixture of tar and gravel. Hotmix, also known as bituminous concrete, is actually a mixture of asphalt cement, crushed stone and sand. Unlike tar, which is a derivative of wood or coal, asphalt is a residue of crude oil refinement. Asphalt cement, 5% of the weight of hotmix, acts as a binding material to hold the crushed stone particles together.

To Our Readers

The State of Delaware and the consultant team are committed to continuing the citizen input process during the design and construction phases of the project. We invite you to write us with questions or comments regarding *On the Road* or to arrange for a presentation to bring your group up to date on the Relief Route. To receive your free copy of *On the Road* as well as other mailings related to the project, please write or call us with your request.

For More INFORMATION

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- Public Information - contact Michele Ackles, Manager of Community Relations, at 736-4313.
- Design Issues or Alignment Location - contact Carolann Wicks, Project Coordinator, at 736-4341.
- Environmental Issues - contact Joe Wutka, Location Studies Engineer, at 736-4642.
- Right-of-Way Acquisition and Relocation - contact Ira White, Project Acquisitions Manager, at 736-2776.

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